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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/546,174	04/11/2000	Chih-Chien Liu	JIA 462C1	4793

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EXAMINER

SERGEANT, RABON A

ART UNIT

PAPER NUMBER

1711

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-21

Office Action Summary

Application No.

09/546,174

Applicant(s)

LIU ET AL.

Examiner

Rabon Sergent

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 50-93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 50-93 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 20.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 50, 52-55, 59-61, and 63-69 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tobben et al. ('126).

Tobben et al. disclose the production of semiconductor devices containing electrically conductive wires on a substrate, wherein the method comprises the deposition and etching of layers which correspond to those claimed by applicants. See figures and columns 2-4. Patentees further teach at column 4, lines 10-26 that if an additional metalization layer is to be used, then a layer of dielectric material is deposited over the surface of the structure and within the grooves between the wiring lines. Patentees additionally teach that this layer may be formed by depositing silicon dioxide using high density plasma deposition techniques. The position is taken that applicants' method fails to exclude the use of a second metalization layer and that the last step of applicants' claimed process is met by the disclosure pertaining to the high density plasma deposition of the dielectric within the grooves between the wiring lines. The subject matter of claim 52 is disclosed at column 2, line 40. The subject matter of claims 53 and 63 is considered to be an inherent characteristic of the disclosed deposition process. The subject matter of claims 54 and 64 is disclosed at column 3, line 13. The subject matter of claim 55 is disclosed by the figures. The subject matter of claim 59 is considered to be an inherent characteristic of the etching process, given that the degree of the etching away of the corners is not specified. The subject matter of claims 60 and 69 is considered to be inherent characteristics

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of the disclosed deposition process. The subject matter of claims 65-68 is disclosed within column 4, lines 5-18.

3. Alternatively, in view of the aforementioned teachings within Tobben et al., the position is taken that it would have been obvious to utilize a high density plasma deposition technique to incorporate a dielectric material onto the surface of the wiring line containing substrate and within the grooves between the wiring lines, so as to insulate the wiring lines from external influences.

4. Claims 56-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tobben et al. ('126).

As aforementioned within paragraphs 2 and 3, Tobben et al. are considered to disclose a process of filling grooves between conductive lines with dielectric material using high density plasma chemical vapor deposition. While patentees specifically disclose rectangular gaps or grooves, patentees fail to recite other cross-sectional shapes for the grooves, such as trapezoidal or triangular cross-sections; however, the position is taken that the production of such shapes by controlling the parameters of the etching process was known and conventional at the time of invention. Accordingly, the selection of such cross-sections amounts to an obvious design choice and the implementation of such choices requires only the control of result effective variables.

5. The examiner has carefully considered applicants' response, and the prior art rejections have been modified accordingly. Applicants' argument that the cap layer of the prior art lacks a uniform thickness is not well taken in view of the disclosure concerning layer 16b at columns 3,

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lines 9-11 and figure 2A. Figure 2A indicates that cap layer 16b has a uniform thickness, considering that the disclosed nonplanar and nonuniform layers, as disclosed by the prior art in the text of the disclosure, are clearly represented within the figures as being nonplanar and nonuniform. Furthermore, the position is taken that any thickness would be suitable to "reduce" reflectivity.

6. Claims 61-64, 66-74, and 79 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Though the preamble of method claim 61 specifies that the gaps are filled with dielectric material, the claim fails to recite any process step that results in the gaps being filled. The claim merely requires that a layer of the dielectric material is formed on the surface.

7. Claims 50-79 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The terminology, "to reduce reflectivity of light passing through such cap", is considered to be subjective language which fails to further define the claim. Since any thickness will reduce the reflectivity, the language without numerical limitations, fails to be further limiting or meaningful.

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8. Claims 70-73 and 75-78 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The antireflective coating lacks antecedence from the independent claims.

9. Claims 50-93 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Support for the amendments to claims 50 and 61 has not been found within the specification. Furthermore, support for the subject matter of claim 80 has not been found within the specification. Applicants are required to indicate where support exists for the amendments to claims 50-61 and new claims 62-93. Contrary to applicants' statement, new claims 80-90 do not find support within claims 38-49.

10. Claims 80-93 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicants have failed to clearly define "adjustable etching component".

11. Claims 80-93 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the

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invention. Applicants have failed to provide enablement for the adjustment of the etching component to achieve a desired result.

12. Claims 80-93 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Despite applicants' response, it remains unclear how "based" is to further limit or define "plasma" or "process".

13. Claims 80-93 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Despite applicants' response, the specification provides no guidance with respect to what is meant or encompassed by a "plasma based process".

Furthermore, in the absence of such guidance, the language pertaining a first plasma based process and a second plasma based process constitutes new matter.

14. Claims 80-93 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Despite applicants' response, applicants have failed to provide enablement for the use of processes other than high density plasma chemical vapor deposition for the "first plasma based process". Within the specification, applicants have indicated that other deposition techniques are

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unsuitable. See pages 3, 4, and 6 of the specification. Therefore, it cannot be argued that enablement has been provided for other deposition processes.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication should be directed to R. Sergent at telephone number (703) 308-2982.


RABON SERGENT
PRIMARY EXAMINER

R. Sergent
June 1, 2003